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TI Drug-polyionic block copolymer interactions for **micelle** formation: physicochemical characterisation.
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AB While covalent attachment of small drug molecules to AB copolymers for the formation of polymeric **micelles** for drug delivery has been investigated, few studies have focused on non-covalent interactions. The aim of this study was therefore to explore the potential of non-covalent interactions between an AB copolymer, Poly(aspartic acid)-poly(ethylene glycol) (Pasp-PEG), with anionic pendant groups and diminazene aceturate, a small molecular weight cationic drug. **Micelles** were prepared by mixing solutions of Pasp-PEG and diminazene in 25 mM Tris-HCl buffer. At all Pasp-PEG concentrations studied, the **micelles** appeared to be water soluble with a unimodal **size distribution** and ranged in size from approximately 22 to 60 nm. The polyionic **micelles** also displayed similar and small absolute zeta potential values at various drug:monomer molar ratios which confirmed stabilisation by the PEG corona. The scattering intensity was maximal and remained unchanged, while particle size increased slightly at pH range from 3.4 to 7.2. At this pH range both the polymer and drug would be ionised and ionic interactions possible to drive micellar formation. An increase in size and scattering intensity with addition of NaCl to the **micelles** was attributed to dehydration of the PEG corona which may have led to aggregation of the **micelles**. The absence of micellar dissociation upon addition of **salt** was attributed to the dominance of hydrogen bonding between Pasp and diminazene aceturate, as assessed by isothermal titration microcalorimetry. Morphological evaluation of these constructs showed them to be discrete and fairly uniform in size and shape. This study was therefore successful in confirming the potential of non-covalent interactions using an AB copolymer to form polyionic **micelles** for drug delivery.